

Birth Order Distribution as a Family Planning Program Evaluation Indicator

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Introduction

The success of the National Family Planning Program in Thailand (NFPP) is evidenced by the consistent increase in contraceptive prevalence rate among married women of child bearing age (15-44 years) during the past 10 years, resulting in a significant reduction in fertility and the population growth rates. The targets of reducing the population growth rate since the Third, Fourth and Fifth National Development Plans have been achieved mainly because of the performance of the family planning effort. In the process of preparation for planning and implementation of the Sixth Plan (1987-1991), it was realized that a greater endeavour to be made to achieve the target set for 1991 because of the increasing number of married women of reproductive age (MWRAs) who will be entering the reproductive cohort during the five-year period.

The contraceptive prevalence rate (CPR) is used now among family, planners and demographers as a NFPP achievement indicator. The crude birth rate (CBR) and total fertility rate (TFR) on the other hand are measures of the fertility status of the population. Empirical evidence has shown a statistically strong correlation between CPR and CBR, CPR and TFR, and CPR and growth rate (provided that the death rate is relatively constant and low). For example, 75 to 80 percent CPR would result in a growth rate of 1.1-1.2 percent (Bongaarts, 1984). If the CPR is about 75 percent the CBR would be in the range of 17-20 per 1,000 population (Nortman, 1982). A CPR of 75 to 80 percent is consistent with replacement fertility. Theoretically, the real success of any population program should ultimately be indicated by replacement level fertility, that is, an estimated TFR of 2.1 or 2.2. The Thai Government has indicated

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that an average family size of two children is a desirable and achievable population goal - that is to keep its population size at a certain limit.

Parity distribution and birth order distribution have long been used for estimation of fertility such as TFR, from existing incomplete data (Brass, 1975). The TFR could be estimated from birth certificate data with a high degree of precision. In addition, the proportion of first births and/or second births to total births derived from birth certificates has been suggested as a means of measuring fertility change (Pardthaisong, 1978).

Two phases of study have been conducted for the development of a simple indicator from birth order distributions for family planning evaluation. The first phase assessed the availability of birth order data nationally and the practicality of tabulating birth order data in Bangkok (Prasartkul, Porapakham and Sittitrai, 1987). The second phase described in this article, investigates the systematic tabulation of these data at the provincial and district level.

A newborn's birth order is simply the number of live births that preceded him (her) plus one. As fertility declines in a population, the percent of births in a year that are low order (e.g. first or second births) should increase. Eventually, when replacement fertility is achieved with a total fertility of about two live births per couple, the percent of all births that are first or second births should approach 100%.¹

While the crude birth rate and the total fertility rate are common measures of the demographic impact of family planning programs, they have the disadvantage of requiring complete data for a large segment of the population to be accurate. By contrast, birth order distributions can be calculated for small subgroups of the population with reasonable accuracy provided that under registration is more or less equal across orders. In addition, birth order data are available and tabulated on a monthly basis throughout Thailand.

The minimum data required for quality birth order analysis are live birth order of the birth, date of birth, residence of the mother and age of the mother.

The first phase of this multi-phase study found that the collection and compilation of birth order data is widespread. Yet there are irregularities in how the data are stored and compiled from agency to agency. Figure A readily shows that birth order data at the central level have obvious deficiencies. **While the Ministry of Interior (MOI) data in Bangkok are complete and have the greatest coverage, they are stored on**

microfilm by individual birth certificate and thus are totally impractical for periodic assessment among administrative areas. The central MOI data also lag behind by one to two years because of processing bottlenecks.

Despite the fact that the central registration office of the MOI has computerized individual birth certificates since 1984, information on birth order are not included yet.

While the Ministry of Public Health (MOPH) Bangkok data are computerized and are aggregated by province, they only represent deliveries at MOPH hospitals and health centers and thus, bias against sub-groups at the socio-economic extremes. Furthermore, the data cannot be disaggregated by district without modifications to the data processing software.

Figure A.
Birth Order Data in Thailand

Source	Agency	Birth Order	Date of Birth	Residence of Mother	Age of Mother	Stored on	Aggregated to What Level	Coverage	Latest Date Available (as of December 1987)
M. of Interior	Vital Registration Division	yes	yes	yes	yes	microfilm	individual (i.e. not aggregated)	all delivery sites	December, 1986
M. of Public Health	Health Statistics Division	yes	yes	yes	yes	computer	province	MOPH outlets only	June, 1986
M. of Public Health	Provincial Chief Medical Office	yes	no ¹	no ²	yes ³	paper file	province, district	MOPH outlets only	current month
M. of Public Health	Provincial Chief Medical Office	yes	yes	yes	yes	paper file	individual	MOPH outlets only	current month
M. of Public Health	District Health Office	yes	yes	yes	yes	paper file	individual	all delivery sites	current month
M. of Interior	District Registrar	yes	yes	yes	yes	paper file	individual	all delivery sites	current month

¹ Data are tabulated by the date the birth is reported

² Data are tabulated by the area in which the delivery takes place

³ Age is grouped in five-year categories

At the provincial level the planning and evaluation section of the Provincial Chief Medical Office produces a monthly hand tabulation of district births by order and age group of mother. These data however refer to the site of the delivery and the date refers to when the birth report was made. In addition, individual birth certificates are available but may only represent MOPH outlet deliveries, thereby missing private outlets and home deliveries.

The conclusion of the first phase of this study was that the only routinely accessible, up-to-date, quality birth order data are at the provincial level and must be tabulated locally. The FSB, the proportion of first and second order births to total registered births, is recommended as a model indicator, primarily at the provincial and national level.

The FSB indicator is an ideal measure for managers. It is simple to analyze and understand, it can be obtained wherever there is a birth certificate and it is highly correlated with the contraceptive prevalence rate (CPR), crude birth rate (CBR) and the total fertility rate (TFR).

These correlations are shown in Table 1. CPR, the family planning achievement indicator, is highly correlated with FSB, the birth order indicator, for every time period examined. The correlation coefficients are high and statistically significant, especially for the 1985 data with correlation of 0.879 and 0.739 for January and December respectively.

Table 1. Correlations between the birth order indicator (FSB) and CBR, TFR, CPR, 1980, 1984 and 1985

	FSB ₈₀	FSB ₈₄	FSB ₈₅
CBR ₈₀	- 0.514		
CBR ₈₄		0.251	
CBR ₈₅			- 0.569
TFR ₁₉₇₅₋₇₉	- 0.786		
CPR ₈₀	0.650		
CPR _{Jan 85}		0.815	0.879
CPR _{Dec 85}			0.739

Note : 71 provinces, excluding Bangkok and Mukdaharn.

At the national level, the FSB indicator could be adopted for future use to evaluate family planning performance by province, or additionally to validate the reported contraceptive prevalence. Furthermore, the recommended indicator could identify particular administrative areas requiring additional inputs to accelerate family planning performance and to assess the achievement of the two-child family norms. If the FSB indicator is to be used as an indicator of family planning achievement at the provincial level, births by place of residence need to be considered. At the district level, birth certificates from both sources, i.e., the District Administration Office and the District Health Office, are equally accessible. The FSB indicator can be calculated

simply and updated for any period of time, provided that not many births occur outside the district of residence.

This article tests a system for processing birth order data at the district level in five southern Muslim provinces of Thailand, namely Yala, Pattani, Narathiwat, Satun and Songkhla. The reason Muslim areas of Thailand were selected is that the National Family Planning Program (NFPP) needs more careful assessment for these areas. This is because the Muslim subgroups of the population resist the modern methods offered in the NFPP outlets yet may effectively practice traditional methods of birth spacing and limitation, such as breastfeeding, folk treatments and withdrawal, which are outside the health statistics system. Project interventions at the district level that promote these methods should be able to be evaluated by birth order analysis over time (allowing of course for an appropriate time lag).

Evaluation systems at both the provincial and district levels were tested. To be viable, the system of FSB analysis must meet the following conditions:

- (1) The raw data are based on birth certificates, not on aggregated tabulation unless aggregated tabulations are not greatly biased.
- (2) The collection of birth certificates for a given year are not specific to any delivery site and do not systematically exclude subgroups of the local population.
- (3) The birth certificates that are missed by the system are proportionally distributed across birth orders.
- (4) The four data items required for quality birth order analysis are complete on the birth certificates.
- (5) The raw data are easy to locate and tabulate by district area by an officer from the local office which keeps the certificates.

While it may not always be possible to meet all these conditions they are a goal to be strived for to be consistent with the project's objectives as stated below. The research team may also hold discussions with local officials of both the Ministry of Public Health and Interior to see how easily the concept of birth order as a family planning indicator is understood.

Objectives

The goal of this phase of the project is a time series family planning evaluation system that is independent of formal participation in the NFPP and independent of the age structure of the population. Thus the specific objectives of the Phase II Study are the following:

1. To test a system for processing the FSB indicator at district level in five southernmost provinces of Thailand.
2. To compare the FSB indicator with 1980 Census fertility and contraceptive prevalence data.
3. To assess the feasibility of time-series analysis of the FSB indicator for evaluation of family planning program inputs.

Methodology

Data collection

To fulfill the first objective of the study, the investigators examined the existence and completeness of the birth certificates (part III of which contains the birth order data) filed at the Provincial Chief Medical Offices (PCMO) of the study provinces. Variations of document filing at each province are observed. Yala is the only province where the individual birth certificates have been kept in a satisfactory condition since 1980. The data are available and complete for all districts. Thus Yala Province is selected as a case study for the time-series analysis of the FSB indicator.

The birth order data for 1984 and 1986 of the five study provinces are available in the form of microfilm filed at the Central Registration Office of the MOI in Bangkok. For comparative purposes the required birth order data at the district level for 1986 were tabulated and linked with the 1984 data already obtained in phase I of the project.

The study variables from the birth certificate include :

- Province/district of registration (where birth is reported)
- Birth Order

- Birth date (in month/year)
- Age of mother
- Date of registration (in month/year)
- Mother's residence (district, province)

Assessment of data quality

In this phase of the study, raw data are drawn from the individual birth certificates. A transfer of birth order information for Yala Province was carried out at the Provincial Chief Medical Office (PCMO) where the third part of the individual birth certificates are filed in original forms. The filings are already grouped by district and by year of registration.

For the other four provinces, namely Pattani, Satun, Narathiwat and Songkhla, the data for 1986 are on microfilm and available at the Central Registration Office of the Ministry of Interior. Birth order data were then transferred into coding forms in Bangkok.

The collection of birth certificates available for this study in a given year are not specific to any delivery site and do not systematically exclude subgroups of the local population, provided that the liveborn babies were reported to the local registrar.

In addition, it was found that close to 95 percent of the birth certificates examined in this study contained complete information on the four data items required for quality birth order analysis (live-birth order, date of birth, residence of mother and age of mother).

The current phase of data assessment takes into consideration the birth date and date of registration, the unknown or blank entry on birth order and the place of mother's residence.

Results

Registered births in Yala Province were examined through birth certificates from the district of birth place in 1980, 1982, 1984, and 1986. Registration improved markedly in Muang Yala district and Betong in 1984 following intensified management procedures in these districts. For the other four study provinces (Pattani, Satun, Narathiwat and Songkhla) registered births are examined for 1986 only.

Births by lateness of registration

Table 2 and 3 then examine late registration. Late registration will adversely affect the FSB indicator if it happens irregularly or if late registration occurs unevenly among women of different parity. The results for Yala Province show that late registration never accounts for more than eight percent of all births. It is also found that the trend in late registration is constant. For the other four provinces in 1986, late registration ranges from as low as six percent to nine percent of all births. That the vast majority of births are registered in the year of occurrence suggests that the timeliness of the FSB indicator is not impaired due to tardy registration behavior.

Table 2. Percentage distribution of registered births by years of birth, Yala Province

Years of birth	1980	1982	1984	1986
Registered at the same years	91.2	91.4	92.8	92.3
Born 1-5 yrs earlier	2.1	2.0	2.8	5.2
6-10 yrs	1.2	1.3	1.6	0.7
11-15 yrs	1.7	1.5	1.3	0.7
16-20 yrs	2.7	2.2	1.0	0.6
21-25 yrs	0.3	0.6	0.2	0.5
Percent of late registration	8.0	7.6	6.9	7.7
Unknown	0.8	-	-	-

Table 3. Percentage distribution of births registered in 1986 by years of birth

Years of birth	Pattani	Narathiwat	Satun	Songkhla
Born in 1986	91.4	90.1	92.0	93.6
Born 1-5 yrs earlier	2.3	4.6	2.9	2.9
6-10 yrs	1.9	2.0	1.6	0.9
11-15 yrs	1.3	1.4	1.6	0.8
16-20 yrs	1.6	0.9	1.0	0.8
21-25 yrs	1.3	0.5	0.5	0.9
Percent of late registration	8.4	9.4	7.6	6.3
Unknown	0.2	0.5	0.4	0.1

Births by residence of mother and place of registration

To answer the question of what proportion of deliveries takes place in the province of mother's residence, Table 4 crosstabulates provincial birth place with provincial residence of the mother. If out-of-province birth registration by women of lower or higher parity is unequal among provinces this will bias the FSB indicator to

either artificially high or low values depending on the direction of flow to delivery sites. Table 4 shows that for four of the study provinces in 1986 (Pattani, Narathiwat, Satun and Songkhla) approximately 90% of mothers delivered in their home province. Because Yala Province contains a large MCH hospital that is especially designed for regional delivery services it attracts women from neighboring provinces such as Pattani, Songkhla and Narathiwat. This exposes a weakness of the FSB indicator as collected from the MOPH summary form for provinces with large MCH hospitals. This bias is not found for the neighboring provinces and suggests that the unadjusted birth registration data from the MOPH forms can be used for assessing the levels of FSB of women in those provinces.

Table 4. Percentage distribution of births at reported provinces by province of mother's residence among the 5 study provinces in 1986

Place of mother's residence	Place of registration				
	Pattani	Yala	Narathiwat	Satun	Songkhla
Pattani	88.2	18.2	3.5	0.2	1.8
Yala	3.2	69.5	1.4	0.1	0.5
Narathiwat	2.2	3.3	91.2	0.0	0.5
Satun	0.0	0.2	0.0	89.8	1.2
Songkhla	2.9	4.6	0.8	2.7	85.6
Provinces in the South	1.6	2.1	1.0	5.4	7.3
Provinces outside southern region	1.8	2.1	2.2	1.8	3.0
Total	100.0	100.0	100.0	100.0	100.0
N	(10,052)	(8,535)	(10,123)	(4,440)	(19,805)

One of the potentially strong advantages of the FSB statistic for family planning management is that the data are routinely tabulated at the district level. Thus, provincial managers have a fertility and family planning achievement indicator available on a monthly basis that can be used both to evaluate their programs and to guide planning and allocation of resources.

Table 5 examines time series data on the percentage of births which are registered in the same district as the mother's residence for 1980, 1982, 1984 and 1986 in Yala. Before 1983 in Yala birth certificates from metropolitan areas were not included in reports and approximately 90% of mothers whose births were registered and tabulated also delivered in the districts where they lived. This pattern changed

dramatically in 1984 after the inclusion of birth certificates for deliveries in municipalities, leading to a four-fold increase in tabulated births. In 1984, district of registration matched district of residence for only 56% of births in Muang Yala District but was as high as 88% for Betong District on the Malaysian border. Inter-district migration to deliver seemed to increase in 1986 during which only 45% of births in Muang Yala District were delivered in the home district and the comparable figure for Betong decreased to 83%. All other districts in Yala also show a decrease in home district delivery.

Table 5. Percentage of births which are registered in the Districts of Mother's Residence, by district, Yala Province, 1980-1986

District	1980		1982		1984		1986	
	%	No. of registered births	%	No. of registered births	%	No. of registered births	%	No. of registered births
1. Muang Yala	93.5	(1,084)	90.5	(1,046)	56.3	(4,343)	45.2	(4,519)
2. Bannangsta	95.8	(545)	89.4	(605)	69.2	(676)	62.1	(697)
3. Betong	98.3	(234)	99.6	(240)	88.4	(878)	83.1	(895)
4. Yaha	82.0	(861)	78.0	(829)	72.4	(801)	68.5	(980)
5. Tanto	93.9	(196)	93.2	(132)	77.9	(154)	71.3	(195)
6. Raman	91.4	(1,267)	94.4	(1,235)	82.3	(1,119)	79.8	(1,249)
Total		(4,182)		(4,087)		(7,971)		(8,535)

Note: Births registered in Muang Yala and Betong in 1984 and 1986 include births reported to municipal authorities.

The other provinces show slightly higher levels of home district delivery approaching an average of 80% for all except the capital, Muang District (Table 6). Satun has the highest percent of home delivery of registered births with district-level values ranging from 74% to 86%.

Table 6. Percentage of births which are residence in the District of Mother's Residence, by District, Pattani, Narathiwat, Satun and Songkhla Province, 1986

District	Pattani		Narathiwat		Satun		Songkhla	
	%	(N)	%	(N)	%	(N)	%	(N)
1	57.7	(2,205)	65.2	(2,140)	74.5	(1,824)	69.4	(4,477)
2	72.1	(905)	88.1	(910)	76.0	(699)	87.7	(1,067)
3	86.1	(620)	84.2	(652)	78.4	(296)	77.2	(843)
4	79.1	(1,258)	84.5	(516)	84.4	(904)	81.2	(1,005)
5	80.4	(1,385)	83.2	(1,589)	84.5	(336)	73.4	(1,060)
6	77.9	(1,163)	75.1	(887)	86.4	(381)	84.4	(585)
7	79.1	(953)	81.0	(741)			76.0	(1,115)
8	77.0	(309)	70.8	(291)			72.5	(783)
9	81.6	(147)	83.6	(721)			55.5	(7,305)
10	77.9	(901)	58.0	(107)			69.0	(715)
11	78.5	(205)	75.4	(171)			88.6	(70)
12			71.8	(423)			87.7	(163)
13							89.6	(386)
14							87.0	(231)
Total		(10,051)		(10,123)		(4,440)		(19,805)

Note :

Pattani :

- | | | |
|------------------|--------------------|--------------|
| 1) Muang Pattani | 5) Yaring | 9) G.Maikaen |
| 2) Khok pho | 6) Saiburi | 10) Mayoh |
| 3) Panare | 7) Nong chik | 11) G.kapoh |
| 4) Yarang | 8) G.Tungyangdaeng | |

Narathiwat :

- | | | |
|---------------------|--------------|-------------------|
| 1) Muang Narathiwat | 5) Ra-ngac | 9) Su-ngai padi |
| 2) Tak bai | 6) Rusoa | 10) Su-ngai kolok |
| 3) Bacho | 7) Waeng | 11) G.Sukirin |
| 4) Yi-ngo | 8) Si-sakhon | 12) G.Ja-nae |

Satun :

- | | | |
|-----------------|------------|----------------|
| 1) Muang Satun | 3) Thungwa | 5) G.Khuan don |
| 2) Khuan kalong | 4) La-ngu | 6) G.Tha phae |

Songkhla :

- | | | |
|-------------------|---------------|-------------------|
| 1) Muang Songkhla | 6) Sathingpra | 11) G.Na mom |
| 2) Chana | 7) Sadao | 12) G.Krasae sin |
| 3) Thepa | 8) Saba yoi | 13) G.Khuan neang |
| 4) Ranod | 9) Haad yai | 14) G.Bang klum |
| 5) Rattaphum | 10) Na-thawi | |

Home-district delivery is desirable from the standpoint of the Ministry of Public Health because maternal care resources are allocated to each district based on

catchment area population. However it is clear from this analysis that crossing district boundaries to deliver is common, unequal and increasing among districts in the five study provinces.

Births of unknown order

If the percent of births of unknown order is high, the FSB indicator will be biased if missing data is disproportionate among birth orders. Table 7 shows that the percent of births of unknown order in Yala is decreasing in four districts and increasing in two (It is suspected that the trends in Bannangsta and Raman are the result of clerical factors). As of 1986 the percent of births with unknown order for Yala as a whole was 8.7% and ranges among districts from a low of 0.7% to 43.4%.

Table 8 shows the corresponding data for the other four provinces for 1986. The percent of births of unknown order ranges among provinces from four percent in Satun to eleven percent in Pattani. District level proportions of unknown birth orders range even more widely from 0.3% to 42.5%.

Table 7. Percentage distribution of unknown birth order to total registered births by district, Yala Province, 1980-1986

District	Percent of unknown birth order			
	1980	1982	1984	1986
1. Muang Yala*	28.7	29.5	1.0	0.7
2. Bannangsta	10.8	11.9	4.6	43.4
3. Betong*	4.2	1.7	1.6	4.8
4. Yaha	34.2	31.3	5.3	3.7
5. Tanto	36.4	35.1	3.2	2.5
6. Raman	21.1	22.6	13.4	26.1
Total	24.5	23.1	3.6	8.7

* Retained municipality

Table 8. Percentage distribution of unknown birth order and number of total registered birth by district Pattani, Narathiwat, Satun and Songkhla in 1986

District	Pattani		Narathiwat		Satun		Songkhla	
	%	(N)	%	(N)	%	(N)	%	(N)
1	13.0	(2,339)	16.5	(2,148)	4.4	(1,831)	8.6	(4,572)
2	8.1	(906)	1.0	(910)	8.6	(699)	4.9	(1,068)
3	5.0	(623)	3.8	(654)	2.4	(296)	6.5	(848)
4	6.8	(1,264)	1.2	(516)	3.1	(908)	5.7	(1,009)
5	10.9	(1,387)	9.0	(1,625)	0.3	(336)	10.7	(1,067)
6	5.9	(1,167)	8.7	(888)	0.5	(381)	1.9	(585)
7	24.2	(954)	2.4	(743)			22.7	(1,136)
8	20.4	(316)	6.2	(2,920)			4.1	(784)
9	5.4	(148)	6.5	(721)			8.4	(7,437)
10	6.1	(906)	7.2	(1,081)			4.7	(721)
11	4.4	(206)	2.9	(171)			67.1	(70)
12			4.6	(432)			1.8	(163)
13							42.5	(409)
14							9.5	(232)
Total		(10,217)		(10,181)		(4,451)		(20,101)

Note :

Pattani :

- | | | |
|------------------|--------------------|--------------|
| 1) Muang Pattani | 5) Yaring | 9) G.Maikaen |
| 2) Khok pho | 6) Saiburi | 10) Mayoh |
| 3) Panare | 7) Nong chik | 11) G.kapoh |
| 4) Yarang | 8) G.Tungyangdaeng | |

Narathiwat :

- | | | |
|---------------------|--------------|-------------------|
| 1) Muang Narathiwat | 5) Ra-ngae | 9) Su-ngai padi |
| 2) Tak bai | 6) Rusoa | 10) Su-ngai kolok |
| 3) Bacho | 7) Waeng | 11) G.Sukirin |
| 4) Yi-ngo | 8) Si-sakhon | 12) G.Ja-nae |

Satun :

- | | | |
|-----------------|------------|----------------|
| 1) Muang Satun | 3) Thungwa | 5) G.Khuan don |
| 2) Khuan kalong | 4) La-ngu | 6) G.Tha phae |

Songkhla :

- | | | |
|-------------------|---------------|-------------------|
| 1) Muang Songkhla | 6) Sathingpra | 11) G.Na mom |
| 2) Chana | 7) Sadao | 12) G.Krasae sin |
| 3) Thepa | 8) Saba yoi | 13) G.Khuan neang |
| 4) Ranod | 9) Haad yai | 14) G.Bang klum |
| 5) Rattaphum | 10) Na-thawi | |

The FSB indicator

As defined earlier, the FSB indicator is the proportion of all births that are first and second order. As contraceptive prevalence increases so should the value of FSB. As fertility declines the value of FSB should increase. Table 9 presents the values of FSB for the five provinces in 1986. According to the data, Narathiwat has the highest fertility with 50% of all births being third or higher order followed by Satun, Pattani and Yala. Songkhla has the lowest fertility as measured by the FSB indicator with nearly two-thirds of all births being first or second order.

Table 9. Proportion of first and second order birth of all birth for five provinces in 1986

Provinces	FSB	Unknown birth order	Total registered birth
Yala	60.0	8.7	9,421
Narathiwat	51.1	7.9	10,181
Pattani	54.3	10.6	10,217
Satun	52.8	4.0	4,451
Songkhla	65.1	9.3	20,101

Because the above review of district patterns in birth registration showed a significant level of cross-border delivery and registration, it is important to examine the FSB measure for all registered births in a district compared with the FSB for births to mothers living in the district of delivery. Table 10 presents these data for districts in the five provinces in 1986. The far right column of the table shows the absolute percentage point difference between the two FSB ratios. It is found that the difference between the in-resident FSB and the FSB for all births never exceeds ten percentage points. Indeed, the provincial average differences between the values of the FSB range from only two to four percentage points.

The Muang, or capital district, records the highest discrepancies between in-residence birth orders and all births occurring in the district, but the differences do not exceed 8.4 points. The higher FSB for all births in Muang districts suggest that lower parity women are attracted to the provincial capital hospitals. Among non-Muang districts about the same number have positive differences as have negative differences. This suggests that, even though mothers are delivering outside their home district, the pattern is random and does not seriously bias the value of the FSB when mother's residence is not taken into account.

Table 10. FSB indicators by district showing comparison between data by place of registration and by place of mother's residence, 1986

Province/District	FSB(T)	FSB(R)	Difference
Narathiwat			
1. Muang Narathiwat	57.6	49.7	7.9
2. Takbai	41.0	42.3	-1.3
3. Bacho	50.9	50.3	0.6
4. Yi-ngo	48.8	50.0	-1.2
5. Ra-ngae	51.7	52.8	-1.1
6. Rusoa	46.6	48.1	-2.6
7. Waeng	50.3	49.3	1.0
8. Si-sakhon	50.3	50.7	-0.4
9. Su-ngai padi	45.6	49.1	-3.5
10. Su-ngai kolok	57.3	48.7	8.6
11. Ging Sukirin	51.8	52.4	-3.8
12. Ging Ja-nae	51.4	49.5	-1.0
Total	51.1	49.5	1.6
Satun			
1. Muang Satun	55.8	50.9	4.9
2. Khuan kalong	54.1	53.4	0.7
3. Thungwa	50.8	51.4	-0.6
4. La-ngu	49.2	48.5	0.7
5. Ging Khuan don	49.8	52.7	-2.9
6. Ging Tha phae	48.3	48.3	0.0
Total	52.7	50.7	2.0
Yala			
1. Muang Yala	65.3	59.2	6.1
2. Bannangsta	47.4	54.4	-7.0
3. Betong	58.6	57.0	1.6
4. Yaha	52.9	54.8	-1.9
5. Tanto	42.1	47.1	-5.0
6. Raman	52.5	52.6	-0.1
Total	60.0	56.1	3.9

(Cont.)

Table 10 (cont.)

Province/District	FSB(T)	FSB(R)	Difference
Pattani			
1. Muang Pattani	57.1	48.7	8.4
2. Khok pho	56.1	56.2	-0.1
3. Panare	55.2	53.8	1.4
4. Yarang	48.9	48.9	0.0
5. Yaring	52.6	52.3	0.3
6. Saiburi	57.1	54.3	2.8
7. Nong chik	48.3	49.8	-1.5
8. Ging Tungyangdaeng	55.2	53.1	2.1
9. Ging Maikaen	55.8	55.7	0.1
10. Mayoh	55.7	55.8	-0.1
11. Ging Kapoh	56.8	55.2	1.6
Total	54.3	52.2	2.1
Songkhla			
1. Muang Songkhla	68.8	68.9	-0.1
2. Chana	52.7	56.8	-4.1
3. Thepa	53.3	54.9	-1.6
4. Ranod	59.6	56.7	0.1
5. Rattaphum	56.9	56.7	0.2
6. Sathingpra	56.6	58.5	-1.9
7. Sadao	54.3	59.8	-5.5
8. Saba yoi	51.9	52.3	-0.4
9. Haad yai	73.2	69.7	3.5
10. Na-thawi	62.6	64.4	-1.8
11. Ging Na mom	78.3	76.1	2.2
12. Ging Krasae sin	52.5	60.2	-7.7
13. Ging Khuan neang	47.7	55.1	-7.4
14. Ging Bang klum	48.1	53.8	-5.7
Total	65.1	63.3	1.8

In sum, it seems from this analysis that the FSB as derived from all registered births in the district (and especially the province) accurately predict the FSB as derived from the birth order deliveries of resident mothers.

Conclusion and Recommendations

The FSB was conceived as a simple diagnostic tool for provincial managers to assess areas of need and achievement in family planning and fertility. Although it is

statistically correlated with the total fertility rate and the contraceptive prevalence rate, the FSB measure should not be used to predict the values of these rates. Instead, the percent first and second births of all births should be used to rank administrative areas as high or low priority for action and for tracking progress toward national contraceptive prevalence and fertility goals.

This study has shown that the FSB measure is robust enough to serve the needs of national and provincial managers for assessment of family planning achievement. The service statistics reporting system should begin including FSB tabulations for regions, provinces, and districts immediately. Where data are available for past years and months, the FSB indicator should be calculated retrospectively to present time series data to assess trends. The simplest tabulation for a FSB feedback report is the percent first and second order births of all births by month, district, province, region and the nation.

Notes

- ¹ A small percentage would be still third and higher order births but these are compensated for by sterile and one-child couples in replacement fertility society.

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